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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/530,308	04/04/2005	Liesbeth Van Pieterson	NL 020916	9931
24737	7590	05/31/2007		
PHILIPS INTELLECTUAL PROPERTY & STANDARDS			EXAMINER	
P.O. BOX 3001			FULK, STEVEN J	
BRIARCLIFF MANOR, NY 10510			ART UNIT	PAPER NUMBER
			2891	
			MAIL DATE	DELIVERY MODE
			05/31/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>
	10/530,308	VAN PIETERSON ET AL.
	<b>Examiner</b>	<b>Art Unit</b>
	Steven J. Fulk	2891

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 04 April 2005.  
 2a) This action is FINAL.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-13 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1-13 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on 04 April 2005 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1.) Certified copies of the priority documents have been received.  
 2.) Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3.) Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |                                                                                                                                 |                                                                   |
|---------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                            | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>4/4/05</u> . | 5) <input type="checkbox"/> Notice of Informal Patent Application |
|                                                                                                                                 | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Priority***

1. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in the EPO on October 7, 2002. It is noted, however, that applicant has not filed a certified copy of the EPO 02079152.1 application as required by 35 U.S.C. 119(b).

### ***Claim Objections***

2. Claim 9 is objected to because of the following informalities: Claim 9 recites the limitation "the cathode electrode". There is insufficient antecedent basis for "the cathode electrode" in the claim. Claim 9 should apparently depend from claim 8. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Chung et al. '494. The process limitation of catalytically growing the carbon nanotubes found in product claim 12 invokes the product-by-process doctrine. Product-by-process claims are not limited to the manipulations of the recited steps, only the structure implied by the steps (*MPEP § 2113*). For example, anticipation of claim 12 does not require the carbon nanotubes to be catalytically grown.

Regarding claim 1, Chung et al. discloses a method of manufacturing a field emission device, comprising the steps of distributing particles (fig. 1H, 18') on a transparent substrate (11), at least a part of the particles being arranged for emitting electrons (¶43, carbon nanotube emitters); depositing a photo layer (18' is a photo layer); illuminating the field emission device from the substrate side (fig. 1I; exposing backside of substrate 11), the particles shading regions of the photo layer (fig. 1I, nanotube particles 18 block regions of photo layer above it); etching the shaded photo layer (fig. 1J) and forming, near the particles, a gate electrode (17) being provided with a pattern of apertures (openings over nanotubes 18) for passing electrons.

Regarding claim 2, the reference further discloses providing a conductive layer (fig. 2E, 25), the photo layer comprising a positive photo resist and being deposited on top of the conductive layer (fig. 2F; ¶49 & 50, conductive layer 25 is patterned by a typical PR (photoresist) process); and the etching step comprises further steps of removing the shaded regions of the photo layer and forming the pattern of apertures in the conductive layer adjacent to the removed shaded regions (fig. 2F, patterned layer 25), for forming the gate electrode (fig. 2K, 25).

Regarding claim 3, the reference further discloses heating the conductive layer during a pre-selected time (¶42, firing process performed on structure, including conductive layer).

Regarding claim 4, the reference further discloses providing an insulating layer (fig. 2I, insulating layer 26') at least partially covering the particles, whereby the photo layer (26' is a photo layer) comprises a negative photo resist and is

deposited on top of the insulating layer, and the etching step comprises further steps of removing parts of the negative photo layer outside the shaded regions (fig. 2J, 26) exposing parts of the insulating layer, and depositing electrode material on the exposed parts of the insulating layer for forming the gate electrode (fig. 2K, 25).

Regarding claim 5, Chung et al. discloses a field emission device comprising a distribution of particles (fig. 1J, 18; carbon nanotube emitters) on a substrate (11), at least a part of the particles being arranged for emitting electrons; a gate electrode (17) near the particles, the gate electrode being provided with a pattern of apertures for passing emitted electrons, characterized in that the pattern of the apertures is similar to the distribution of the particles (open space over carbon nanotubes).

Regarding claim 6, the reference further discloses an insulating layer (fig. 1J, 15) is provided between the substrate (11) and the gate electrode (17), the insulating layer at least partially covering the particles (layer 15 extends above nanotubes 18 and therefore covers them).

Regarding claim 7, the reference further discloses the insulating layer (fig. 1J, 15) is recessed substantially at the location of the particles.

Regarding claims 8 and 9, the reference further discloses the substrate (fig. 1J, 11) is transparent and comprises a transparent indium tin oxide cathode electrode (12).

Regarding claim 10, the reference further discloses the particles (fig. 1J, 18; carbon nanotubes) comprise a graphite-based field emitter.

Regarding claims 11 and 12, the reference further discloses the particles comprise carbon nanotube (fig. 1J, 18).

Regarding claim 13, the reference further discloses a display device comprising the field emission device of claim 5 (¶02-04).

***Conclusion***

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Guillom et al. '323, Mao et al. '750, Twichell et al. '283, Hsu '701, Choi et al. '802, Fran et al. '548 and Park et al. '915 disclose methods of making carbon nanotube field emission devices.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven J. Fulk whose telephone number is (571) 272-8323. The examiner can normally be reached on Monday through Friday, 9:30am to 6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Baumeister can be reached on (571) 272-1722. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

7. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

*SJF*

Steven J. Fulk  
Patent Examiner  
Art Unit 2891  
May 23, 2007

**B. WILLIAM BAUMKISTER**  
**SUPERVISORY PATENT EXAMINER**  
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*B Wm Baumkister*